

What is claimed is:

1. A receiver operable for use in a telemetry system,
comprising:

a decision feedback equalizer capable of receiving at least one data input channel, said decision feedback equalizer producing an estimated symbol sequence output during a plurality of iterations of operation of said decision feedback equalizer, said decision feedback equalizer further comprising a symbol-by-symbol detector, said symbol-by-symbol detector being operable for receiving said estimated symbol sequence output and operable to produce a symbol-by-symbol detector output for use as feedback within said decision feedback equalizer;

a decoder for receiving said estimated symbol sequence output and for producing a decoded output; and

an iterative feedback connection between said decoder and said decision feedback equalizer to provide feedback from said decoder for use in at least some of said plurality of iterations of operation of said decision feedback equalizer.

2. The receiver of claim 1, wherein said decoder is a Viterbi decoder.

3. The receiver of claim 1, wherein said decoder is a MAP decoder.

4. The receiver of claim 1, further comprising:

a feedback filter within said decision feedback equalizer;
and

a switch between said symbol-by-symbol detector, said iterative feedback connection and said feedback filter, said switch being operable for selectively connecting said symbol-by-symbol detector output to said feedback filter or for connecting said iterative feedback connection to said feedback filter.

5. The receiver of claim 4, wherein said switch is operable for connecting said symbol-by-symbol detector output to said feedback filter during a first iteration of said plurality of iterations and then connecting said iterative feedback connection to said feedback filter for subsequent of said plurality of iterations at least until a stop criterion is reached.

6. The receiver of claim 1, further comprising a feedback filter wherein said feedback filter is operable for receiving hard values of decoded symbols from said decoder by means of said iterative feedback connection.

7. The receiver of claim 1, wherein said iterative feedback connection between said decoder and said decision feedback equalizer connects to said symbol-by-symbol detector.

8. The receiver of claim 7, wherein said iterative feedback connection provides log likelihood ratio information, and said symbol-by-symbol detector further comprises:

a converter for converting said estimated symbol sequence output to log likelihood ratio information; and

a combiner producing a combiner output by combining said log likelihood ratio information from said iterative feedback connection and said log likelihood ratio information from said converter.

9. The receiver of claim 8, wherein said symbol-by-symbol detector further comprises a decision module for receiving said combiner output and producing hard values of decoded symbols.

10. The receiver of claim 9, wherein said decision feedback equalizer further comprises a feedback filter for receiving said hard values of decoded symbols

11. A method of operation for a receiver, said method comprising:

iteratively processing a received signal with a decision feedback equalizer to produce estimated symbol sequence information;

post-processing said estimated symbol sequence information with a decoder, said decoder comprising at least one of a Viterbi decoder or a MAP decoder;

providing a feedback connection between said decoder and said decision feedback equalizer to provide feedback information from said decoder for use in at least some of a plurality of iterations of said processing by said decision feedback equalizer.

12. The method of claim 11, further comprising selectively utilizing said feedback information from said decoder so that after a first iteration of said processing by said decision feedback equalizer, then said feedback information is utilized in

subsequent of said plurality of iterations of said processing at least until a stop criterion is reached.

13. The method of claim 12, further comprising controlling a switch for connecting said feedback connection to a feedback filter of said decision feedback equalizer.

14. The method of claim 11, further comprising combining said estimated symbol sequence information with log likelihood ratio information produced utilizing said decoder.

15. The method of claim 14, further comprising processing said estimated symbol sequence information prior to said step of combining.

16. The method of claim 15, wherein said step of processing further comprises converting said estimated symbol sequence information to log likelihood ratio information.

17. The method of claim 16, wherein said step of converting further comprises multiplying said estimated symbol sequence by a factor.

18. The method of claim 17, wherein said factor comprises computing a variance of said estimated symbol sequence.

19. The method of claim 11, further comprising iteratively processing BPSK modulated signals.

20. The method of claim 11, further comprising iteratively processing MPSK modulated signals.